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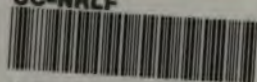
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"Forest and Stream"
HAND-BOOK FOR RIFLEMEN.

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PRESENTED BY
PROF. CHARLES A. KOFOID AND
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THE
Forest and Stream
HAND-BOOK FOR RIFLEMEN.

GIVING FORMS FOR ORGANIZATION OF RIFLE ASSOCIATIONS, BY-LAWS, RULES
FOR PRACTICE AND COMPETITION; PRACTICAL HINTS CONCERNING
RANGES, TARGETS, SCORING, RIFLES, SHOOTING, ETC.; AND
A LIST OF RIFLE ASSOCIATIONS IN AMERICA.

Illustrated
WITH MAPS, SKETCHES AND DIAGRAMS.

BY MAJOR GEORGE C. STARR.

Secretary, American Rifle Association.



NEW YORK:
J. B. FORD & COMPANY.
1876.

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P R E F A C E.

IN presenting this little volume to the Riflemen of America, the author does not claim originality for all the matter contained in it. His object has been simply to present the greatest amount of practical information, particularly as regards the formation of clubs and the paraphernalia required, in the most condensed form. To Colonel GEO. W. WINGATE, Inspector-General of Rifle Practice of the State of New York, the author is indebted for valuable hints and facts taken from his admirable "*Manual*." He would also make similar acknowledgment to the "FOREST AND STREAM," which was the first newspaper to report a rifle match at Creedmoor, and which since that time has been foremost among its fellows in earnest effort to promote the growth of Rifle Shooting in America; and the title of the book is intended merely as a recognition of these facts. Wherever the author has found a point of practical value, and capable of being put in so condensed a work as this, he has noted it down in its proper place in this little volume.

In brief, the aim has been to make a pocket guide-book of handy reference for riflemen, (especially as members of civil Associations for cultivating this manly accomplishment,) to make it so simple and free from technicality that it will be easily intelligible, and to put it in form so compact that it can be furnished at a sum within the easy means of every one needing the information.

GEO. C. STARR.

NEW YORK, *March*, 1876.

PART I.

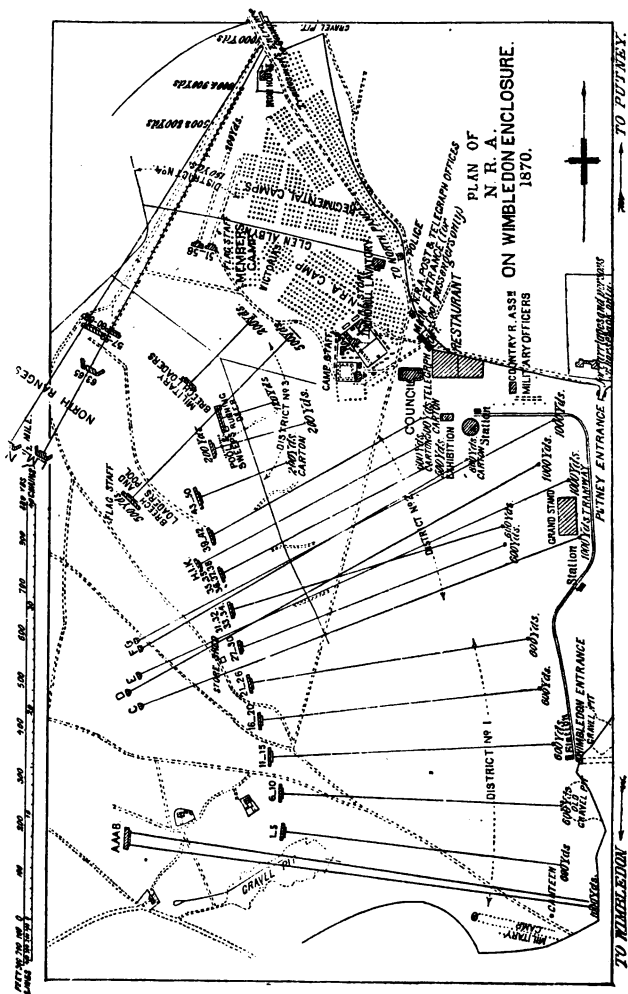
THE RIFLE, AND RIFLE ASSOCIATIONS.

To shoot well is becoming of as much importance to men of to-day as it was to men of a century ago. He who by his steady hand and true eye shows his superior marksmanship will always find favor in the eyes of his countrymen.

About the fifteenth century, Gaspard Zoller, a gunmaker in Vienna, to facilitate the loading of his guns, and to permit the use of tightly-fitting bullets, was in the habit of grooving the barrels. When the grooves were made so as to form a spiral, he found that greater accuracy was obtained. Thus the rifle was invented. The conical bullet was not introduced until two centuries had elapsed. Since then the improvement has been rapid. The flint-lock rifle of "Hawk-Eye," so deadly at one hundred yards, has given place to rifles equally accurate at over a thousand yards. The old muzzle-loader is fast being superseded by the breech-loader, and numerous are the makers, each claiming superiority as regards accuracy and finish.

The credit of having first systematized rifle-practice belongs to England. The idea of forming an Association for the encouragement of rifle shooting was first practically embodied by the volunteers assembled at Hythe for instruction in musketry in July and August, 1859. They formed a committee to give effect to their views, which joined with the council of the London Rifle Brigade in forming the National Rifle Association. The first meeting was held at the Spencer House, London, when it was resolved to hold a public meeting. The meeting subsequently took place at the Thatch House Tavern, London, on Nov. 16, 1859, at which a large number of the leading men of the country were present. Lord Elcho was chosen Chairman, and the Right Hon. Sidney Herbert, M.P., was made President of the Association.

It became necessary then to select a site upon which to establish a range. Wimbledon was chosen as possessing the requisites of space, safety, and accessibility to the metropolis. On the following page we give a map of this admirable ground, and the arrangement of its targets and ranges.



MAP OF WIMBLEDON RANGE.

The first prize meeting, which was a great success, took place July 2, 1860. The first gun was fired by the Queen, who thus inaugurated the new Association. From the first annual report we find that the total number of members was 1,387, of whom 285 were life members; that the total receipts were £8,452 sterling; that after all expenses were paid there was a balance of £1,114 sterling. From the last report (1875) we find that the total number of members was 3,115; that the receipts were in the neighborhood of £20,000, while the expenditures amounted to £16,000. The number of entries in different matches was 105,462. About sixty-four county and thirty colonial Associations are connected with the National Association, and its popularity and importance increase yearly.

In this country the National Rifle Association was organized in New York City, by about thirty gentlemen, June 10, 1870. Gen. A. E. Burnside was the first President; Col. Wm. C. Church, of the *Army and Navy Journal*, Vice-President; Col. Geo. W. Wingate, Secretary. In July, 1872, Gen. Burnside resigned, when Col. Church was made President, and Gen. Alexander Shaler, Vice-President. A Bill was passed in May, 1872, by the Legislature of the State of New York, which gave the Association \$25,000. Ten thousand more was added by the Supervisors of New York and Brooklyn. Finally, seventy acres of land were purchased on Long Island, of a Mr. Creed, which cost \$26,000. It was christened *Creedmoor*, after its first owner. The tract is situated on the Central Railroad of Long Island, about twelve miles from Hunter's Point. It can be reached by taking the Ferry at James's Slip or East Thirty-fourth street, New York. The fare to Creedmoor and back, exclusive of ferriage, to those who purchase excursion tickets is *fifty cents*. This range is probably the finest in the world. It is perfectly level; an embankment thirty feet high is built across the northern portion, at the foot of which are placed the targets. At first, great difficulty was experienced in exciting interest in rifle shooting; but, by liberal offers, emulation has been aroused, which, together with the international matches, has at last succeeded in developing a great interest in the subject, and organizations are springing up all over the country.

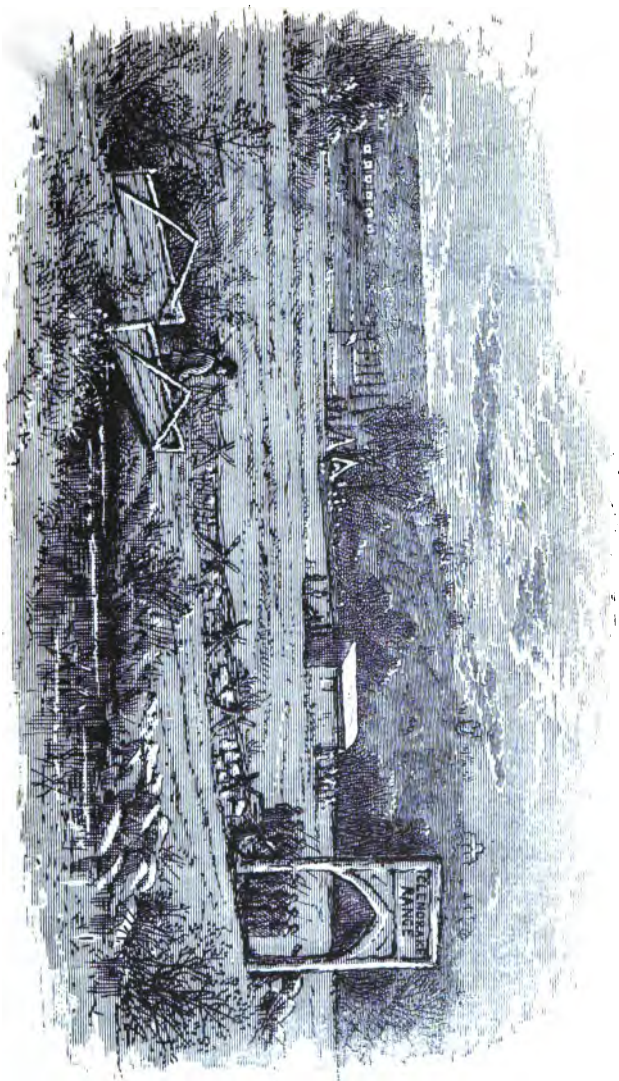
The Amateur Rifle Club was organized in 1872, and affiliated with the National Rifle Association, using the range at Creedmoor for practice and matches. It numbers over one hundred members, and contains as many good long-range shots as any rifle organization in

existence. It was this club that accepted the challenge of the Irish Rifle Team, which was the first match to decide the championship of the world. The story of the success of our riflemen in their contests at Creedmoor, on Long Island, and Dollymount, in Ireland, has been so often well told, and has become such a household topic, that it needs no repetition.

The American Rifle Association was organized at Mount Vernon, Westchester County, N. Y., Dec. 5, 1874, mainly through the efforts of Captain Frederick Whittaker, who was one of the original corporators of the National Rifle Association. With considerable pluck the young organization began work at once upon a temporary range; targets were erected upon the new Wimbledon plan, rules were adopted similar to the revised Wimbledon rules, and matches were held, the result of which was such as to warrant the Directors in securing land for a permanent range. They succeeded in procuring sixty-three acres of Mr. Thomas S. Drake, within ten minutes' walk of Pelhamville depot, on the New York, New Haven and Hartford Railroad, the distance from the Grand Central Depot, N. Y., being about fifteen miles. The time occupied in reaching the range is about thirty-five minutes. The cost to those who purchase excursion tickets is *seventy-five cents*. The canvas target, and the telegraph worked by a corps of operators, were introduced first by this Association in this country. In honor of the owner, the range has been called Glen-Drake.

Gen. J. Watts De Peyster, for the purpose of encouraging off-hand shooting, presented to this Association a medal which is said to be the most artistic and handsome ever made in America for a similar purpose.

The Yonkers Rifle Club, with their range at Morsemere, the Ausable Valley Rifle Club, the Saratoga Rifle Club, the Holyoke Rifle Club, organized soon after; Waterbury and New Haven placed Connecticut Associations in the field; San Francisco and Chicago followed suit; and little Rhode Island, not to be outdone, establishes a range, perfect in every respect, under the characteristic name, "What-Cheer." Every month adds one or more Associations to the list. In ten years from this time the probabilities are that the United States can boast of as many rifle organizations as exist at present in the rest of the world.



PART II.

PRACTICAL HINTS FOR ASSOCIATIONS.

ORGANIZATION.

To those about to organize themselves into an Association we give the following advice: As many as possible meet at an appointed time, adopt By-Laws (a good general form for which we give below, though the numbers of members of committees, Boards, etc., must, of course, depend upon the size of the organization in each case), and elect officers.

BY-LAWS.

I. NAME.

This Association shall be called the ——— Rifle Association.

II. OBJECT.

Its objects shall be to promote rifle practice, and for this purpose to provide a suitable range or ranges, in a convenient location in ———.

III. MEMBERS.

The number of members shall be unlimited, unless two-thirds of the members present at a special meeting shall decide otherwise.

IV. MANAGEMENT.

1. A Board of Directors, consisting of ——— members elected by the Association, shall control its affairs, take cognizance of all infractions of the By-Laws, and fill vacancies in their own body until the time of the next annual meeting.

2. The Officers of the Board shall consist of a President, a Vice-President, a Treasurer, and a Secretary, which officers shall, with three other members of the Board of Directors, constitute an Executive Committee. These officers and the Directors shall be elected at the annual meeting, by ballot of the members of the Association present, a clear majority of the votes cast being requisite to a choice.

3. A quorum of the Board of Directors shall consist of two-thirds of the members of the Board.

4. The interpretation of the Rules and By-Laws shall rest with the Board of Directors.

5. The Board of Directors may, by unanimous vote from time to time, elect

Honorary Directors, not to exceed — in number, from those to whom in their opinion the association may be under obligations; such Honorary Directors to hold office for one year. Any person who shall pay one hundred dollars into the Treasury shall be elected Honorary Director for Life, and shall be provided with a suitable badge at the expense of the Association. Honorary Directors shall be exempt from all dues, and shall be entitled to a voice but no vote at the meetings of the board.

6. The following Standing Committees, each to consist of three members, shall be appointed by the President during the month of January in each year: 1. Finance Committee, 2. Range Committee.

V. DUTIES OF OFFICERS.

1. The President of the Association, or in his absence the Vice-President, shall authorize the call of all meetings of the Board of Directors, and shall have power to call special meetings of the Association at the request of — of the Board of Directors or — members of the Association.

2. The Secretary of the Association shall notify each member of the Board of Directors of all its meetings, and each member of the Association of every meeting of the Association; issue all other authorized notices to members; make and keep a true record of all meetings of the Directors and of the Association; have custody of the books, papers and corporate seal of the Association, and conduct all correspondence.

3. The Treasurer shall collect and have charge of the funds of the Association, and pay such bills as have been audited by the Executive Committee. He shall keep the accounts of all his transactions and make a detailed report thereof, with vouchers annexed, at each regular meeting of the Directors and an annual report to the Association at its annual meeting. He shall give bonds in such sum as shall be fixed by the Board of Directors.

4. The Finance Committee shall have general supervision of the finances of the Association. They shall from time to time examine the accounts of the Treasurer and keep themselves informed of the financial condition of the Association. To this committee shall be referred the Treasurer's reports and all questions and propositions relating to the finances of the Association; and no obligation of the Association beyond those necessary for current wants shall be made until the Finance Committee have considered and reported to the Executive Committee upon the necessity and propriety of the plan proposed.

5. The Range Committee shall have charge of the grounds and all the property of the Association. They shall recommend to the Board of Directors such changes and improvements as in their judgments are necessary or desirable, and shall supervise such improvements, and direct the operations of the men employed. They shall keep the Range supplied, by the purchase of all necessary articles for the use of the Range-keeper and the Markers. They shall keep and audit all claims and bills against the Association for supplies used at the Range, and endorse all certificates given under contracts; and no such bills, claims, or certificates shall be paid until so audited or endorsed. But this committee shall have no power to make contracts or purchases in the name of the Association for anything more than the usual supplies, unless the same is authorized and ordered by a formal vote of the Executive Committee. They shall prescribe the duties, and direct and regulate the services of the Range-keeper and all other persons employed on the Range. They shall require the Range-keeper to make monthly returns of the

property in his charge in such form as they shall prescribe, which returns shall show :

1. The amount of property on hand last return.
2. The amount received during the month.
3. The amount expended.
4. The amount sold.
5. The amount lost or destroyed.
6. The amount remaining on hand.

Such returns shall be examined and endorsed by the Committee or its Chairman, and presented regularly to the Board of Directors for examination and filing. They shall make such temporary rules and regulations for the use of the ground and the targets as shall seem necessary to ensure the most privileges to the greatest number. They shall see that contracts for work to be done and materials to be furnished, and agreements for rents and privileges at the Range, are faithfully executed ; and generally do and perform everything needful to protect the interests of the Association, and secure a successful management of the Range.

VI. THE BOARD OF DIRECTORS.

1. The stated meetings of the Board of Directors shall be held on the first Tuesday of each month, for the purpose of hearing reports from Secretary, Treasurer, and Committees, and taking needful action thereon. Special meetings may be called at any time by the President, or in his absence, by the Vice-President ; and shall be called by either of them upon the request of three members. Notice of all meetings shall be given in writing by the Secretary to each member of the Board through the Post Office, addressed to their respective places of business or residences, but no special meeting shall be held except upon a previous notice of at least two days to each member.

2. It shall be the duty of the Executive Committee to inquire into and report to the Board all infractions and violations of the rules and regulations of the Association by any of its members, accompanied by any recommendations that it may deem desirable. It shall also have power to employ and at pleasure remove all employees needed for the current business of the Association, and to do all acts in and about the management of its affairs which usually pertain to the duties of an executive committee.

3. All special committees for any purpose shall be appointed by the presiding officer.

4. Any member of the board who shall, in its opinion, conduct himself in a manner seriously prejudicial to the interests of the Association may be removed by the Board of Directors at any stated meeting, provided the member accused shall have at least ten days previously been notified personally in writing of the charges against him, and a hearing given him thereon at a stated meeting to be therein specified. But such removal can only be effected by the affirmative vote of at least two-thirds of all the members of the Board.

5. Neglect on the part of any Director to attend six successive meetings of the Board shall be deemed a tender of his resignation of his office. But the Board may excuse any member for such neglect, and before his resignation is accepted under this by-law, the member in default must be specially notified of such default.

6. No debt exceeding one hundred dollars shall be contracted without the vote of at least six directors.

VII. RECORDS AND ACCOUNTS.

Any Director or any member of the Association may at any time examine the records of the Secretary, and inspect the accounts of the Treasurer.

VIII. MEMBERSHIP.

Any person giving his name, age and address shall, upon paying the requisite dues, become a member of the Association, subject to the right of the Board of Directors to reject his name, and return his dues in case they shall deem it required by the interests of the Association.

IX. RIGHTS AND DUTIES OF MEMBERS.

1. All members of the Association shall be entitled to equal rights and privileges.

2. The annual dues shall be — dollars, payable in advance on the first day of January in each year.

3. All military organizations formed under State or United States laws shall be entitled to constitute all their regular members in good standing members of this Association, on the payment of one-half the annual dues for the current year for each member present at the annual inspection. All moneys paid by members of such organizations, who shall previously have joined as individuals, shall be credited to the aggregated sum to be paid for the admission of said regiment or company.

4. Any enlisted man or officer of any regularly organized military association may become a member, upon presentation to the Secretary of proper proof thereof and the payment of — dollars annual dues.

5. Any member can become a member for life by the payment in one sum of — dollars, and shall thereafter be exempt from all dues and assessments.

6. Any member, regiment or company who shall neglect to pay any indebtedness to the Association on demand shall forfeit his or their membership in the Association, and cannot be reinstated except by vote of the Board of Directors and payment of all arrears.

7. No member shall be allowed to transfer his rights of membership.

8. Any member whose conduct shall be pronounced by vote of the Board of Directors to have endangered, or be likely to endanger, the welfare, interest or character of the Association, shall forfeit his membership. Such vote shall not be taken without giving two weeks' notice to the offender of the charges made against him, and affording him an opportunity of being heard in his defense.

9. Any member having complaints or suggestions to make to the management of the Association must do so in writing to the Executive Committee.

10. No member shall take any property whatsoever belonging to the Association from its rooms or grounds, except on the authority of a resolution of the Executive Committee.

11. Any member wishing to resign shall hand his resignation in writing to the Secretary ; but no such resignation shall be accepted until all debts to the Association of the member so resigning shall have been paid.

12. All rights and interests of a member in the property and privileges of the Association shall cease with the termination of his membership.

X. MEETINGS.

1. The members of the Association shall hold an annual meeting on the second Tuesday of January in each year, and such special meetings as may be called pursuant to the By-laws. If the annual meeting cannot take place at the time fixed, it shall be held as soon after as convenient, and the officers and Directors whose terms of office have expired shall hold over until their successors are appointed.

2. It shall be the duty of the President, or, in his absence, of the Vice-President, to call a meeting of the Association on receiving a requisition signed by ten members. In the notice calling any special meeting the particular subjects to be considered shall be specified, and no other business shall be transacted at such meeting except that specified in the notice.

3. — members present at any special or general meeting shall form a quorum for the transaction of business.

4. At no meeting of the Association shall any subject be introduced which does not relate directly to its affairs.

XI. THE RIFLE RANGE.

1. The rifle range shall be under the direction of the Range Committee, who shall establish rules relating to its management and shall have authority to employ such markers and other assistants as may be found necessary.

2. The scores made by the members shall be recorded in such manner as the Board of Directors shall from time to time prescribe. In case of a challenge given to or received from other marksmen, the result of each latest consecutive practice of each member shall be averaged, and the representatives of the Association shall be selected by the Directors in the order of merit according to the latest averages.

3. Payment of the annual subscription is necessary to entitle a member to the use of the range. Non-members may be permitted to use it under such restrictions and on payment of such amount as the Board of Directors may fix. The range shall be free to members on such days as may be fixed by the Board; on other days each member shooting must pay for the services of the markers.

4. No betting shall be allowed on the grounds of the Association.

XII. AMENDMENTS TO BY-LAWS.

To amend these By-laws, the proposed amendment shall be subscribed to by at least — members, and by them presented to the President, who shall cause the proposed amendment, with the signatures thereto, to be brought before the Board of Directors at the next meeting thereafter. In case the Directors, by a majority vote, recommend its passage, the Secretary shall issue notices, enclosing a copy of the amendment, to all the members of the Association, and a vote of two-thirds of all the members present at the next annual meeting, or at a special meeting called for the purpose, in favor of the proposed amendment, shall be requisite for its passage.

INCORPORATION.

Having adopted By-Laws, then, if possible, become incorporated under such laws as the State may provide. In New York such organizations may become incorporated under the act in regard to Clubs and Associations. The form used may be as follows :

CERTIFICATE OF INCORPORATION

STATE OF	}	ss :
COUNTY OF		
TOWN (OR		
VILLAGE) OF		

Know all men by these presents—That we the undersigned, —, —, being citizens of the United States and the State of —, do hereby, pursuant to and in conformity with an Act of the Legislature of the State of —, entitled "An Act, etc.," passed on the — day of —, eighteen hundred and —, and the various acts of said Legislature amendatory thereof, do associate ourselves together and form a body politic and corporate, and so certify :

• That the corporate name by which said society shall be known shall be "The — Rifle Association." The object for which said Association shall be formed is the improvement of its members in marksmanship, and to provide a suitable range for rifle practice in —.

That the number of Directors who shall manage the affairs of the Association shall be —.

That the names of the Directors who shall manage the affairs of the said Association for the first year of its existence shall be as follows :

[Names of Directors.]

In witness whereof we have hereunto affixed our names.

[Signatures of Incorporators.]

The signatures of the Incorporators should be acknowledged before a Notary Public.

RANGE AND TARGETS.

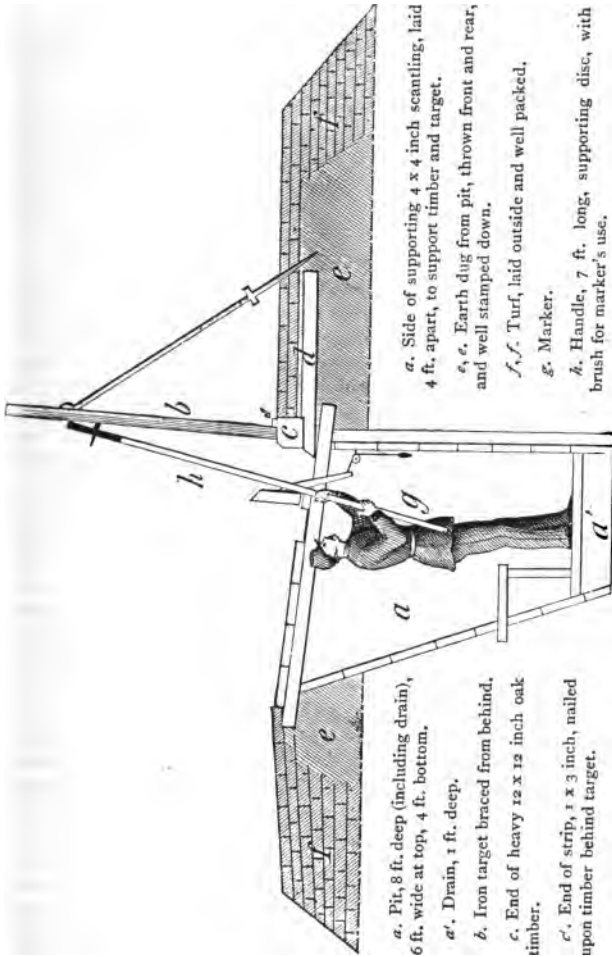
The next step should be the selection of a range. In all cases it is better to lease the ground, with the privilege of buying at some stated price. The nature of the ground should be such as to admit of shooting at all ranges ; it never should be less than 500 yards in length. If possible it should lie in such a position that the firing-point and target shall be North and South. If the targets could be placed at the foot of a hill at least 40 feet in height, at an angle of 45 degrees, it would save the expense of building an embankment, which is always necessary as a matter of safety.

Having procured the *Range*, the next step should be to furnish

the same. The first thing should be to procure *Targets*. The Wimbledon Targets, recently adopted for use at Creedmoor, are described in the Regulations given in future pages; they are also intelligibly illustrated.

Targets can be made of either of three materials—iron, canvas, and wood. The first material has been considered the best; but the second, when constructed in a proper manner, has many advantages over it. Wooden targets should be used for temporary purposes only. The iron target is composed of slabs of wrought iron, which should be one-half inch thick, six feet in length by two feet in breadth. If procured of this size, by joining, targets of all classes can be made from them. The cost of each slab is about \$50. The targets are placed upon a platform, set at right angles to the line of fire, as near perpendicular as possible, and braced from the rear. To paint them, use the following compound: Two quarts of whiting, free from lumps; water enough to make the whiting moist; one pound of dissolved glue, added when fluid; warm water poured in and mixed till the consistency of the mass is about the same as paste. With this paint the iron all over, while the compound is warm. The Bull's-eye and lines can be painted with the same preparation colored with lamp-black.

When Iron Targets are used, it is necessary to have a shot-proof pit or a hut for the markers. The latter is apt to throw a shadow upon the target, and the former should be used when possible. To prepare the pit, excavate a trench the length of all the targets, 8 feet deep, 6 feet wide at the top, 4 feet at the bottom, including a drain 1 foot deep below the board floor; 20 feet should be allowed between every two targets. The trench should be walled inside, front and rear, with 2-inch plank, securely spiked to 4- by 6-inch scantling, placed 4 feet apart, well sunk in the ground at the bottom, and held apart at the top by 2- by 8-inch joists, well spiked on. Over these joists lay a roof of 2-inch plank, leaving a space to place opposite each target a window made of 1-inch plate glass, 12 by 24 inches in size. In the roof place a trap-door, 16 inches by 3 feet long, folding back on the roof towards the firing-point. The earth taken from the excavation should be thrown in front of it and well stamped, and riveted with turf. Steps and entrance to the pits should be made from the end. The cost as given above is about \$30 for each 12 feet. The glass is made by the Lenox Manufacturing Co.,



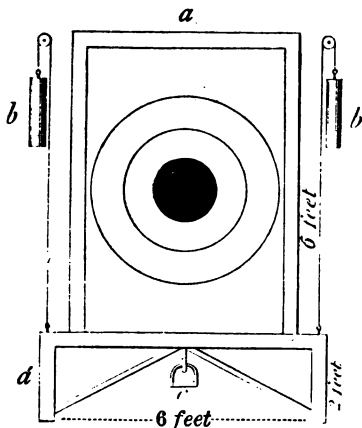
END VIEW OF PIT, IRON TARGET, ETC.
General Plan from "Wingate's Manual."

at Lenox Vale, Mass. ; cost, \$3 per window. When permanent pits are to be made they should be lined with stone ; in which case the trench must be dug two feet wider from front to rear. This of course is more costly. The diagram on page 15 will show the relative positions of pit, marker, and target.

Each pit should be provided, for the use of the marker, with the following articles : A seat, water, a pot of white paint, a pot of black paint, brushes, a danger-flag of red cloth or flannel 3 by 4 feet, and four discs. The discs should be made 18 inches in diameter, of tin or sheet iron. They should be painted white, red, black and white (half and half) and black. Upon the rear center of each disc should be placed a socket into which should be fitted a sash paint-brush 4 inches long. The whole should be securely fastened upon a pole 7 feet in length. This is for the marker to use in erasing the marks of the bullets, the color of the disc he uses showing the value of the shot. Thus: *Bull's Eye* counts 5, signal, *White* Disc ; Center, 4, *Red* Disc ; Inner, 3, *White and Black* Disc ; Outer, 2, *Black* Disc. A socket for the danger-flag should be placed in front of each target. Extra pots of paint and brushes should be kept in the pit, or behind the butts. Hammer and nails and a white-wash brush will often be of service.

The marker, having taken his place in the pit, closes the trap, and when the bullet strikes the target he sees and hears the splash upon the iron. He then takes the appropriate disc, opens the trap, and paints out with the brush at the back of the disc the mark made by the bullet, while the front of the disc shows to the firing-point the value of the hit. He then closes the trap and awaits another shot. In no case should he leave the pit without displaying the danger-flag.

The Canvas Target, which is in use at Glen-Drake, possesses many advantages over Iron Targets, except perhaps for the longest ranges. Safety, reliability, and cheapness, all are combined in it. The plan of the same upon page 17 explains itself. The canvas should be covered before each match with paper, upon which should be painted the lines and bull's-eye. Simple rye-flour paste will hold the paper firmly to the canvas. The cost of each target-frame and one third-class and one second-class target, made so as to run in the same frame, together with pulleys, ropes, and weights, is about \$18. The pits for the use of the target should be made of the same size as that previously given for the Iron Target. There is no necessity, however, for covering the top of the pit in the same way, or using any trap or glass. A



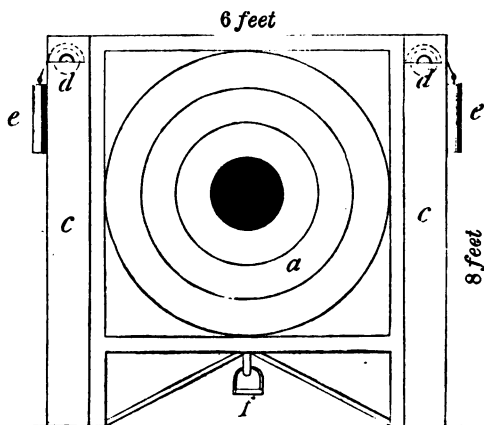
THIRD CLASS CANVAS TARGET.

a. Target frame, 6 ft. high, 4 ft. wide.

d. Running sash frame, 2 ft. high, 6 ft. wide.

b. 32 lb. weight, to counterbalance frame.

c. Handle on running sash frame.



SECOND CLASS CANVAS TARGET.

a. Target. *c, c.* Posts, 8 ft. high, grooved for frame to run in. *d, d.* Pulleys for weights. *e, e.* 32 lb. weights, to counterbalance running sash frame, 8 ft. high by 6 ft. wide. *f.* Handle for marker's use in lowering frame.

cover of wood, hinged in the center so as to fold back upon itself, answers for shelter for the marker; and when the firing is over, the target may be pulled down into the pit, the cover thrown over and locked. Thus the pit may always be ready for the marker; the discs and other articles can remain safely where they are required. The discs which are used for the iron target can be used, but need no brush upon the reverse side and should be painted the appropriate color upon both sides. Notarial seals, white or black, or round pieces of paper of those colors, should be placed in the pits, as well as a pot of paste. When the target is struck, the marker raises the correct disc over the hole made in the canvas, then drops the disc, pulls the target down, wets and sticks the seal over the spot struck. A white one should be placed upon the white portion, a black one upon the bull's-eye. He then pushes up the target, which, being counter balanced by the 32lb. weights on each side, easily runs up in the frame to its place again, and awaits the next shot.

The Wooden Target should be used for temporary purposes only. It is best made of blocks of wood one foot in length (the grain of the wood running with the length), riveted together so as to form a solid block. The marking can be done in the same manner as is done with the iron target, but from an open pit, as there is no danger of the bullet glancing. The cost of a third-class target is about \$8. The size of targets and different classes of them are described in the rules and regulations annexed.

ACCESSORIES.

At the firing-point it is necessary to have a *danger-flag*, which should be placed in front of each firing-point when a marker displays the danger-flag at the targets; a *rope* should be arranged so as to exclude all but the marksman and scorekeeper; a *table* large enough to receive the marksman's rifle and traps; a *box* to receive empty shells is also of value. In addition, each scorekeeper should be provided with a seat, a pencil, a board for score-cards, a copy of rules and regulations, and a whistle. The Officer of the Day should be provided with a good glass to enable him to examine the targets. The Secretary should issue all score-cards, sighting-shot tickets, and ammunition. He should have a score-book, properly ruled, to enter all scores made in matches upon the range. He should have also a trigger-test to examine pull of trigger. The form of score-card should be as shown on the following page:

No. I. MATCH. 200 & 500 YDS.

No. I.

Name,
Target No. Rifle

Name
Target No.

SCORE.	1	2	3	4	5	TOTAL.
200 Yards,						
500 Yards,						

No record to be made of sighting shots.

Total at both Ranges,

Register Keeper's Signature,

1	2	3	4	5	Tot
					200
					500

Tot. at both Ranges,

To be detached by Register Keeper and returned to Competitor.

Back.

I.—Competitors must inform themselves as to the Regulations of the Association, as the plea of ignorance of such Regulations will not be entertained.

II.—This ticket must be presented by the holder at the firing point, or he will not be allowed to compete.

III.—Any erasure, substitution of one name for another, or alterations in the score record, will render this ticket invalid.

IV.—Competitors must remember the number of their scoring tickets.

These score-cards are presented by the holder to the Officer of the Day, who assigns him to the proper target and gives the score-card to the score-keeper. The score-keeper certifies to the score being correct, and returns the ticket to the secretary.

The telegraph, which was first used at Glen Drake, is a valuable attachment to the range. The cost for 500 yards' distance, including batteries and two instruments, is about \$60. Information will be gladly furnished concerning it by Lt. Geo. H. Thompson, President Manhattan Telegraph Institute, New York City.

Flagpoles should be erected upon the range at different points, so as to enable the marksmen to ascertain the direction of the wind at the firing-points; those near the targets should be of red material. The National Colors should also be displayed on Match Days. A Silicate Score-Card and Target, made for the purpose of Record, will also be needed at the firing-points. A row of stakes aligned from the center of each target should be placed, 50 yards apart, back to the most distant firing-point.

In all associations it is best to select a team composed of the most expert—in large associations including as many as twelve—who shall elect a marksman and place themselves under his tuition. It creates emulation for the honor of becoming members of the team, and enables the association more readily to respond to any challenges.

The rules and regulations governing matches which are annexed below will be of great value. They are those adopted by the National Rifle Association for the government of competitions upon the range at Creedmoor. The names of Gen. Alex. Shaler, President, and Maj. Henry Fulton, Secretary of that Association, will testify to the practical value of these Regulations.

REGULATIONS.

I.—MANAGEMENT.

1. All meetings for competitions will be conducted by an Executive Officer, wearing a *tri-colored* badge, aided by a Statistical Officer, wearing a *blue* badge, and assistants, wearing *red* badges.

2. The Executive Officer shall have control of the range for the conduct of matches, and shall give such directions to the employees of the Association as in his judgment are necessary for the proper management of the same, and for the preservation of order.

3. The Executive Officer and his assistants are required to see that the

regulations, and such regulations as the Executive Officer may give, are rigidly complied with by competitors and all other persons upon the range grounds.

4. During the progress of a match they will see that no one, except the officers and employees of the Association, the competitors and the score-keepers, is permitted within the ropes.

5. They will see that the squads of competitors are stationed not less than four yards in rear of the firing points, and that each competitor remains there until called by the score-keeper to take his position at the firing point, and until he has completed his score. The score-keepers will be seated close to and in rear of the firing point stakes.

6. Score-keepers shall, as each shot is signaled, call in a loud voice the name of the competitor and the value of the shot, and at the conclusion of the score of each competitor announce in like manner his name and total score.

7. All competitors shall be allowed to examine the records of the score-keeper during the progress of the match.

8. Any competitor feeling himself aggrieved by the ruling of the Executive Officer may make to the Secretary a statement of his grievances in writing, giving the names of two or more witnesses in the case, which shall be handed at once to the Executive Committee for its consideration. The decision of the Executive Committee shall be final, subject, however, to the discretion of said committee, or any two members of it, to refer the matter to the Board of Directors for its decision.

9. The Statistical Officer shall have charge of all statistics connected with the matches, and shall direct the services of the clerical employees at the spring and fall meetings.

II.—RIFLES.

The rifles allowed to be used in the competitions are—1st. Military Rifles; 2d. Any Rifle; and must comply with the following conditions, viz.:

1. **MILITARY RIFLES**, of bona fide pattern, minimum pull of trigger six pounds, sights, strictly in accordance with regulation pattern. Filing any of the sights, or using them in any other way than as originally intended, is prohibited, except that the sliding-bar of the rear sight may be inverted, and a single line drawn to mark the centre. Sights may be blackened, but not whitened or colored. Any pad or shoe for the heel of the butt is disallowed.

2. **ANY RIFLE**, maximum weight ten pounds, minimum pull of trigger three pounds, sights of any description, except telescope, magnifying and such front aperture sights as solid discs or bushes pierced in the centre, which cover the target so as to conceal the danger signal when displayed.

3. Competitors shall submit their rifles and ammunition for inspection whenever required.

4. No hair triggers will be allowed.

5. No fixed artificial rests will be allowed.

6. In competitions restricted to breech-loading rifles, such rifles must be loaded from the breech only.

III.—AMMUNITION.

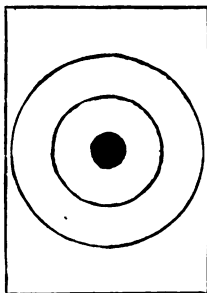
1. For the regular National Guard competitions, ammunition will be furnished by the State and issued to competitors on the ground.

2. In all other competitions, unless otherwise specified, any ammunition may be used, and must be provided by the competitors.

3. Cartridges may be purchased at the office of the Superintendent on the Range Grounds.

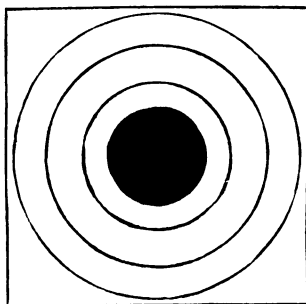
IV.—TARGETS.

The targets are divided into three classes, and shall be of the following sizes :



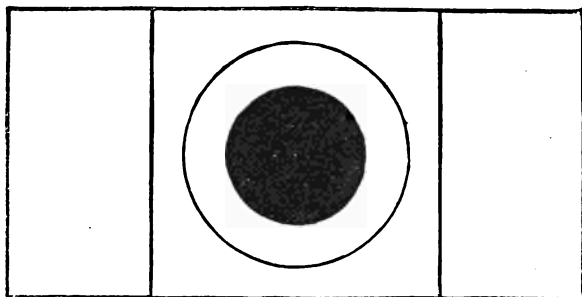
1. *Third Class*, to be used at all distances up to and including 300 yards.—
Target 4 x 6 feet.

Bull's eye, circular, 8 inches in diameter.	Inner, circular, 46 inches in diameter.
Centre, " 26 " "	Outer, square, 4 feet x 6 feet.



2. *Second Class*, to be used at all distances over 300 to and including 600 yards.—
Target 6 x 6 feet.

Bull's eye, circular, 22 inches in diameter.	Inner, circular, 54 inches in diameter.
Centre, " 38 " "	Outer, " 70 " "



3. *First Class*, to be used at all distances over 600 yards.—Target 6 x 12 feet.
 Bull's eye, circular, 36 inches in diameter.
 Centre, " 54 " "
 Inner, square, 6 feet x 6 feet.
 Outer, " 6 feet x 12 feet.

V.—MARKING, SCORING AND SIGNALING.

1. Bull's eye counts 5; signal, white circular disc.
 Centre " 4; " red "
 Inner " 3; " white and black "
 Outer " 2; " black "
 Ricochet " R; " red flag waved twice right and left in front of the target. Ricochet hits will be marked out after the flag signal.
2. When a shot strikes the angle iron upon which the target stands, the marker will open the trap and raise and lower his flag three times in front of the target.
3. When a shot strikes any part of a second-class target outside of the boundary of the "outer," he will open the trap, so as to display the trap danger signal (red square disc) and close it again without marking out the hit.
4. Any objection to the scoring of a shot as signaled, or to one not signaled, must be made before another shot is fired.
5. Any alteration of a scoring ticket must be witnessed by an officer in charge of the firing point, and endorsed with his initials.

VI.—MATCHES.

1. The commencement of matches at the Spring and Fall meetings will be signaled by the firing of two guns, 15 minutes apart. The first will be the signal for competitors and score-keepers to assemble at the firing points, and the second to commence firing.
2. The matches will take place, if possible, in the order named in the programmes. The time for firing them, together with any deviation from the programmes, will be posted upon the bulletin board as long beforehand as practicable.

3. Competitors are requested to frequently examine the bulletin board, where they will learn the targets to which they are assigned, and other necessary information.

4. Temporary discontinuance of matches on account of bad weather, which will be in the discretion of the Executive Officer, and discontinuance for noon-day intermission, will be signaled by the firing of a gun. In each case the competitions will be resumed upon the firing of two guns, as in the commencement.

5. No practice will be allowed upon the range on any of the days of the meetings for competitions. This does not apply to days upon which special matches of the Association, or of affiliating Associations or Clubs, take place.

VII.—ENTRIES.

1. For the State prize, and all other competitions open to National Guard organizations, the teams shall (unless otherwise specified) consist of twelve from each regiment, battalion, company or troop.

2. All regimental officers shall be eligible as members of such teams.

3. In all cases competitors for the State or other prizes offered to military organizations must be regularly enlisted members in good standing of the regiment, battalion, company or troop which they represent, and shall have been such for at least three months prior to the match for which they are entered. All entries must be made for full teams.

4. Entries should be made at the office of the Association, 93 Nassau Street, New York, at least two days preceding the commencement of the meeting at which the match is to take place. A charge of 50 per cent. additional will be made for all entries made after that time.

5. A member of the Association entering for a match on the range must exhibit his member's badge.

6. A register ticket may be transferred at any time before the firing for the match has commenced, by exchanging it at the office of the Statistical Officer for one having the name of the new holder. Any erasure, or the substitution of one name for another, will render the ticket invalid.

7. Competitors who are prevented from being present at any meeting shall have the entrance fees they have paid returned after the meeting, provided that they send their tickets and give written notice to the Secretary before the day on which the prize for which they have entered has been announced for competition.

8. Competitors prevented from competing by illness will receive back their entrance fees in full, on production of a medical certificate and their entry tickets.

9. Post entries are those made after the entry books are closed at the office of the Association.

10. The holders of post entry tickets may be ordered to fire whenever target accommodation can be provided.

11. Should the holders of post entry tickets be precluded from competing by deficiency of target accommodation, their entrance fees will be returned to them, the Executive Officer not being able to guarantee accommodation for all such entries.

12. No post entries shall be made for any competition after the firing in such competition has commenced.

VIII.—SHOOTING.

1. Two sighting shots shall be allowed to each competitor at each distance, on payment of ten cents a shot.
2. Tickets for the sighting shots will be sold upon the ground, and will be good for any match during the meeting. Competitors must decide, before firing, upon the number of sighting shots they will take, and hand the tickets for the same to the scorer. Sighting shots cannot be counted upon a score.
3. Competitors who, at the close of the firing on any day, have not completed the number of rounds prescribed by the conditions of a competition, shall be allowed one sighting shot when such competition is resumed, without charge.
4. In all National Guard competitions the competitors shall place themselves at the firing point by twos, who shall fire alternately until they have fired all their sighting and competitive shots.
5. In other competitions the competitors shall fire their sighting and competitive shots alternately throughout the squad.
6. In all National Guard competitions, competitors shall shoot in the authorized uniform of their corps.
7. Competitors may wipe or clean out their rifles during any competition, except those restricted to the use of military rifles.
8. Whenever the danger flag is displayed, competitors about to fire will be required to open the breech block of their rifles (if breech loaders). If they leave the firing point they must draw the cartridge.
9. No two competitors shall be allowed to shoot with the same rifle in the same match.
10. Any competitor delaying his squad may be passed by. In no case will the firing be delayed to enable a competitor to procure a rifle.

IX.—POSITION.

1. In all matches (except those for cavalry carbines) the position up to and including 300 yards shall be standing. The left elbow may be rested against the body, provided the little finger of the left hand is in front of the trigger guard.
2. In all National Guard infantry matches, at 400 yards, the position shall be kneeling; at distances above 400 yards any position may be taken in which the head is towards the target.
3. In cavalry carbine matches the positions, at 200 yards, shall be standing; at 300 yards, kneeling; over that distance, in any position (as prescribed for infantry).
4. In all other matches, at distances above 300 yards, any position may be taken without artificial rests to the rifle or body.
5. One-armed competitors shall be allowed to use false arms without extra support in the standing and kneeling positions, and to assume any position in the use of military rifles, at distances above 400 yards, the same as is allowed for *any rifles*.
6. Sighting shots may be fired in any position, without artificial rests.

X.—TIES.

I.—Ties shall be decided as follows:

A.—IN INDIVIDUAL SHOOTING.

1. When the firing takes place at more than one distance, by the score made

at the longest distance ; and if still a tie, and there be three distances in the competition, by the score at the second distance.

2. By the fewest MISSES.
3. By the fewest OUTERS.
4. By the fewest INNERS.
5. By the fewest CENTERS.
6. If still a tie, by inverse order of shots, counting singly from the last to the first.
7. By firing single shots at the longest range.

B.—IN TEAM SHOOTING.

1. By the aggregate scores made at the longest distance.
2. By the fewest MISSES.
3. By the fewest OUTERS.
4. By the fewest INNERS.
5. By the fewest CENTERS.
6. By the competitor on each side who has made the highest score firing five rounds at the longest distance.

II.—The names of competitors who have to shoot off ties will be posted on the bulletin-board as soon after each match as practicable.

III.—When the ties are shot off, one sighting shot shall be allowed without charge.

IV.—Competitors not present at the firing points at the hour named for shooting off ties lose their right to shoot.

V.—If, having forfeited their right to compete, they shall still be within the number of prize winners, they shall take any prize that may be allotted to them by the Executive Committee.

XI.—PRIZES.

1. Prize winners will, upon application to the Statistical Officer on the range, receive certificates, which must be given up on receiving the prizes.

2. Prizes will be delivered on the range ground at the close of the meeting, under the direction of the Executive Officer.

3. The principal prizes at the annual Fall meeting will be formally presented to the winners at the State Arsenal, Seventh Avenue, corner Thirty-fifth street, N. Y., on the Saturday following the last day of such meeting, at 8 P. M., unless otherwise announced. Winners who will be unable to attend are requested to give notice at the office of the Association.

4. All prizes not claimed within one month after the match at which they have been won shall be forfeited to the Association.

XII.—PENALTIES.

Competitors must make themselves acquainted with the regulations, as the plea of ignorance of them will not be entertained.

1. Any competitor who fires in a name other than his own, or fires twice for the same prize, shall be disqualified from ever again competing at the prize meetings of the Association, or for any prize offered to the National Guard elsewhere.

2. Should a competitor lose his register ticket, omit to take it to the firing

point, fail to attend at the prescribed hour, or give a wrong ticket, and so by his own neglect miss the opportunity given to him of competing for the prize for which his ticket was issued, his claim in regard to such competition shall be cancelled.

3. Any competitor who shall be detected in an evasion of the conditions prescribed for the conduct of any match shall be disqualified from further competition during that meeting, and forfeit his entrance fees; or if he be guilty of any conduct considered by the Executive Committee as "discreditable," he shall be disqualified from ever again competing at the N. R. A. prize meetings, and shall forfeit all prizes won by him at the current meeting.

4. Any member of a squad or firing party who shall fire a shot from any other firing point after the hour prescribed for his squad to fire, and before he has completed his score (except in pursuance of orders), shall be disqualified in that competition.

5. Any competitor discharging his rifle accidentally, either by his own want of care, or by reason of any defect in the rifle, will be liable to disqualification.

6. Any competitor refusing to obey any instructions of the Executive Officer or his assistants, or violating any of these regulations, or being guilty of unruly or disorderly conduct, or being intoxicated, will be immediately ruled out of all further competition, and forfeit his entrance fees.

7. Any person, whether a competitor or not, interfering with any of the firing squads, or annoying them in any way, will be at once expelled from the ground.

8. Any competitor firing when the danger flag or trap disc is shown at the target or firing point, or knowingly discharging his rifle, except at a target to which he has been assigned, or into the ground, and as may be directed by an officer, shall be debarred from all further competitions during the meeting, and shall forfeit his entrance fees. This shall not apply to a competitor accidentally firing at the wrong target when no danger disc is up.

9. Any competitor firing on a wrong target in any match will be fined \$3, or will be debarred from further competition in such match, or both, in the discretion of the Executive Officer.

10. Any person discharging a rifle or snapping a cap within the enclosure, except in accordance with the regulations for shooting, may, at the discretion of the Executive Officer, be required to leave the ground, and be debarred from further competition.

11. Any competitor or other person found with a loaded rifle, except at the firing points and when about to shoot, may be debarred from further competition during that meeting.

12. Any competitor in National Guard matches using any other ammunition than that issued to him on the ground, or in any way tampering with that so issued, shall be disqualified for all future military matches.

PART III.

HINTS TO THE AMATEUR RIFLEMAN.

"THE best of rifles must be used to give the best results." The question as to whether the muzzle-loader or the breech-loader is of greater accuracy has excited much discussion, but the International matches certainly seem to have decided the question in favor of the breech-loader and central-fire cartridge. To decide upon the merits of the different rifles is a difficult task. In the *Forest and Stream* of November 4th, 1874, is an excellent editorial upon "How to choose a rifle." We extract from it the following valuable suggestions:

"All rifles divide themselves into two great classes—long range and short range.

"The first rule we shall lay down is this: It is necessary to decide whether you want a rifle for long or for short range. You can select either, or both, but not in the same rifle. One will not do the work of the other. A knowledge of this will save much annoyance and some money. We will first consider the requisites of a short-range rifle, and how they are to be attained in practice. 1. The first requisite is, that you shall be able to hit any mark small enough to be seen over what are technically called 'hunting sights,' with an off-hand shot from the shoulder. Greater accuracy than this is not needed. Such a rifle ought to shoot close enough to place a majority of any number of shots within the following sized targets: 2-inch ring up to 50 yards' distance; 4-inch do., 100 yards; 6-inch do., 150 yards; and 8-inch do., 200 yards. A good off-hand shot can do this and fire very quickly, and his gun ought to be able to shoot as close as he can hold it.

"2. The next requisite is, that the trajectory of the ball should be so flat within the above ranges, or, in other words, its velocity so great, that the rifleman should not be obliged to depend on an elevating back sight, raised to distances before ascertained, but should be able, by merely drawing a coarser bead the farther off he is, to hit his mark.

"For long range we want as small a bore as possible, as long a

projectile as possible, and a very quick twist, to give enough velocity of rotation to keep the elongated projectile end foremost, and as much powder as the small bore will burn. The result is a moderate initial velocity, but, owing to the small surface exposed to the resistance of the air, the momentum of the heavy projectile, a very long range.

"Now, for a short-range rifle we require the very opposite of all this. We want as large a caliber as possible; as large a charge of powder as possible, to give a high velocity, without which we cannot have a low trajectory; a short projectile, to diminish the friction on the grooves, and a short projectile requires a slow twist. The length of the rifle barrel must be shorter, which also diminishes friction. To reduce these proportions to practice, we find that the Creedmoor long-range rifle and its ammunition have the following proportions: Weight of rifle, ten lbs.; weight of projectile, 550 grs. (ratio, 1-6); weight of powder, 90 grs.; twist, 1 in 20 inches; caliber, 44-100; length of ball, 1 6-10 inches; length of barrel, 30 inches. A short-range rifle, suited for deer, bears, buffalo, etc., should have the following: Weight of rifle, 9 lbs.; weight of projectile, 320 grs. (ratio, $\frac{1}{4}$); weight of powder, 80; twist 1 in 48 inches; caliber, 55-100; length of projectile, $\frac{3}{4}$ inch; length of barrel, 24 inches.

"The difference in the practical operation of the two rifles will be this: With the long range weapon, if you have your range within a very few yards, and elevate your back sight accordingly, you can make accurate shooting at all ranges. But if you misjudge your distance at all, or even if you know it and have not time to elevate your back sight to its proper height, you will certainly either shoot over or under. With a short-range rifle proportioned as we have described, the drop of the ball, owing to its great velocity, is so little there is absolutely no judging of distance required. Whether you are at 25, 50, 75 or 100 yards, all you have to do is to draw a little coarser bead the greater the distance is. Practice will soon show you how much. Your ball should not deviate more than a couple of inches above or below, and this does not exceed the limit of accuracy heretofore laid down."

Every rifle should have a broad, flat butt.

Having selected a rifle, find out what it is worth by firing ten shots from a fixed rest at each of the ranges, aiming as near one spot on the target as possible. Thus the natural deviation of the rifle will be ascertained. After becoming satisfied that the rifle is a good

one, stick to it until its behavior is perfectly known. Then go to work with confidence, and if a shot is missed the rifleman will probably find that the fault lies in himself, not in the rifle. The care of the rifle should be a great point with its owner; the inside of the barrel should reflect the light like a bright and polished mirror free from dust; no dirt should be allowed in the grooves, and rust should be carefully guarded against. All parts of the rifle should be kept well oiled, and to prevent rust mercurial ointment should be rubbed over the metallic parts. A wooden cleaning-rod should in all cases be used, as an iron one is apt to injure and scratch the barrel. A wet woollen rag, and then an oiled one, should be used. Always clean from the breech of the rifle.

SIGHTS.

These may be classed into two kinds, the "Open Sight" and the "Long-Range Sight." The first is used upon all military rifles and most short-range rifles. The sight used on most long range rifles is the "peep and globe."

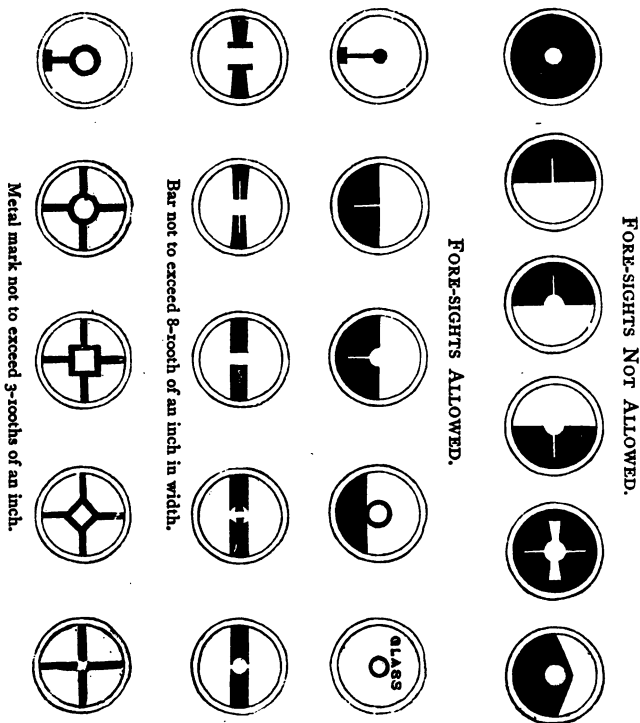


FORE-SIGHT, WITH WIND GAUGE.

The fore-sight, placed in regular position on the rifle-barrel, is made to move from right to left by a screw, and has a scale marked for indicating a perfect wind-allowance. The divisions upon the scale are about 1-40 of an inch, each equal to 2 inches upon the target at every 100-yards, or 20 inches at 1,000 yards, on a barrel 34 inches in length. A small spirit level is placed upon the rear part of the sight, to detect change of elevation from turning the rifle.

Various patterns of foresights have been made to facilitate the marksman's labor; but some are so marked as to give what is considered an unfair advantage. The National Rifle Association has

drawn a distinct line between these two general styles. We give below their classification.



CLASSIFICATION OF FORE-SIGHTS.

The best rear sight is made on a fixed upright, with a Vernier scale and a movable eye-piece, which can be raised or lowered so as to make an alteration of 1-200 of an inch. It is placed generally upon the small of the stock, though some have it placed upon the heel of the butt. Under the latter condition, greater allowance for wind and elevation is required. The scales are divided into



REAR VIEW.



SIDE VIEW.

LONG RANGE VERNIER REAR SIGHTS.

"degrees and minutes" on the Remington rifles. Each minute represents 1-92 of an inch, which, on a 34-inch barrel, is equal to 1 and 1-18 of an inch wind allowance on the target for each one hundred yards. The Sharp rifles have divisions on the Vernier, representing 1-100 of an inch, equal to about 2 inches to each 100 yards. Having once ascertained the zero of the rifle—which can be done by aiming, from a fixed rest, at a small mark, at a distance short enough to avoid all effects of wind—the proper elevation for different distances can be arrived at with greater ease, though it will be found even then a difficult task to make the proper adjustment. To increase the size of the eye-piece and to shield the eye from the sun, some cut a hollow rubber ball in two and screw it on by passing the screw of the eye-piece threw it, leaving the open part of ball towards the eye. Others screw a broad piece of leather upon it in the same manner. All sights should be smoked or blackened to prevent reflection. (The cuts opposite are Remingtons.)

CARTRIDGES.

Central fire cartridges made of brass are by all acknowledged to be the best. The shells can be reloaded, but before reloading they should be carefully examined. If they have become expanded so that they will not enter the loading chamber, they should be cast aside. To cleanse the shells, they should be laid in warm water very shortly after use, and after the cap or primer has been removed. A brush will then remove anything which may adhere to the shell after the discharge. If wiped with a woollen rag and allowed to dry they will be in condition to reload. Some use vinegar for cleaning shells; others use a mixture, made of two parts of water, two parts of sulphuric acid, and one part pulverized bichromate of potash, and afterward wash them in hot water.

Accurate loading is necessary to insure accurate shooting. The powder should be of rather large grain, of uniform quality, well mixed, and of low density. It should be kept in a dry place, or loss of strength will be the result. It should be carefully weighed; or, what is far easier and quite as trustworthy (being the course pursued by some of the most renowned riflemen), it may be measured by flasks made for the purpose. The charge of powder used by most long-range shooters is 90 grains. Before loading, press a fresh cap below the base of the cartridge with a primer.

Care should be taken not to press the powder into the shell so as to crush the grains, which would impair the strength of the powder. Swedged and patched bullets can be readily obtained; they are long, smooth and oval at the point, made of one part tin to twenty parts lead. They should weigh about 550 grains each. The bullet should be inserted into the cartridge upon top of the powder, care being taken to have it as straight as possible. A paper patch is used to prevent leading of the barrel. A lubricating wad is placed by some between the powder and the ball, but the greater number of shooters have dispensed with it.

PERSONAL SUGGESTIONS.

Having thus briefly noticed the rifle, sights and cartridges, we pass to the marksman himself. His food should be of a plain, substantial character, and taken at regular intervals. Tobacco in excess should be avoided. Stimulants should be cast aside; for, though abstaining from them may make any who are in the habit of using them nervous and uncomfortable for a while, the reward for the same will follow in clearer vision and greater steadiness. The clothes should be made of material which will stand the wear and tear of the range. They should be as easy as possible about the arms and throat. In all cases wear heavy boots upon the range. A rubber blanket and woolen rug will be found of benefit to lie upon. In cold weather keep as warm as possible and protect the chest. A close-fitting cap is used by many in long-range shooting. The position of the rifleman at short ranges or off hand is such as requires considerable practice before steadiness can be obtained. If the little finger of the left hand is in front of the trigger guard, the left elbow is allowed to rest upon the body. The regulation position laid down in Colonel Wingate's Manual is probably the best. It is as follows: "Raise the piece slightly with the right hand, make a half face to the right on the left heel; carry the right foot from twelve to eighteen inches to the rear, bring the left shoulder well to the front, the feet at right angles, the right heel a little to the right of the prolongation of the left. The body should be equally and firmly balanced upon both feet and carried naturally upon the hips; drawing in the stomach, raising the breast or bending the back should be avoided. Raise the rifle smartly in front of the right shoulder to full extent of left arm, the arms moving close to the body, the breach sight upright, barrel nearly horizontal and pointing

a few inches below the mark, the head bent slightly forward and to the right, without straining the neck. The left eye closed, the right directed through the back sight at a point just below the bull's-eye, and the point of the fore sight is then aligned on the spot. Place the forefinger around the trigger like a hook, the middle of the finger upon the curve of the trigger. Draw a moderately deep inhalation and restrain breathing until the trigger is pulled. Raise the muzzle steadily with the left hand till the point of the fore sight covers the centre of the object and is in line with it and the rear sight. Then by steady contraction the piece will be fired. Continue the aim for a moment and observe what movement has been made by the piece by the fall of the trigger."

While grasping the barrel firmly with the left hand, the butt should be pressed closely to the hollow of the shoulder with both hands, though some prefer to use only the right. Care should, however, be taken not to press hard enough to throw the shoulder back and affect the equilibrium. Practice in aiming the piece at home will be found of benefit. Place a wafer or other mark upon the wall; then lay an old copper cent upon the barrel just in front of the sight, aim and pull the trigger. If the weapon is turned or the aim unsteady the coin will fall off. Just here it may be well to state that no hammer should be allowed to fall upon the breech block unless an old shell is first introduced into the loading chamber of the barrel. If empty there is no resistance, and there is consequently danger of strain to the firing pin.

The candle practice is also excellent. When the muzzle is held three feet from a lighted candle and a strong cap exploded, the explosion will extinguish the flame, provided the aim has been taken upon the black portion of the wick and is steady. At distances over 300 yards "any position" is allowed, provided, however, no artificial rest is used. In the kneeling position, by sitting firmly upon the right heel and placing the elbow well in front of the left knee, a fair rest is obtained. The sitting position is but seldom used; when it is, the left leg should be in a line with the target, with the right one at right angles to it. The elbows are placed just inside the knees and the body is bent slightly forward. To fire lying down, it is best for each marksman to test and adopt that position which is the most comfortable and best suited to himself. The military position is where the shooter lies upon his stomach, the body curved slightly to the left, the legs more so and well separated, the toes being



MAJOR HENRY FULTON'S POSITION.

(36)

turned outward so as to cause the body to hug the ground as closely as possible. The left elbow should be kept almost straight under the rifle, and the barrel grasped with the left hand. The right elbow should be placed a little to the right. The right shoulder well raised, so as to protect the collar-bone. The rifle must be held firmly against the shoulder. The back position of Major Fulton, used by him in shooting with the Remington rifle at the great matches in Ireland and England [see cut, page 36], is probably the best, and is being used by many who have heretofore used other positions. He lies on his back, the left leg under the right knee, and firmly held by the calf of the right leg. The left arm is placed under the head, the left hand grasps the butt of the rifle, the barrel of the rifle resting in the crotch between the knees. The right hand grasps the small of the stock, the elbow rests upon the ground. The right side of the head touches the left side of the butt, the head turned well to the left to prevent the recoil of the piece striking the jaw.

ELEVATION AND ALLOWANCES.

The rifle and its position are not enough; it becomes the duty of the marksman to obtain also such knowledge of the laws of nature as will allow him to avail himself of their assistance when possible, and to surmount their obstructions to his shooting. It is necessary in this little book, where only a general idea of the whole subject of rifle-shooting can be given, to notice the points most important as briefly as possible.

The *trajectory* of a bullet is the line which a bullet takes in its journey from rifle to target. If the rifle is held in a perfectly horizontal position when fired, the bullet commences to fall at once. In one second it will have fallen about 16 feet, in two seconds about 48 feet, and three seconds about $80\frac{1}{2}$ feet. To counteract this, it is necessary to give a variable amount of *elevation*, depending on the distance. Some rifles have a higher trajectory than others; those having a low trajectory are preferred, as the course taken by the ball is more direct. The *drift* of the rifle is the deviation caused by the twist or the rifling of the barrel twisting or revolving the ball in one direction during its flight. From Wingate's "Manual of Rifle Practice" we extract the following table of

ALLOWANCES FOR DRIFT OF RIFLE.

Distance,	100	200	300	400	500	600	700	800	900	1,000	yards.
Drift,	2	5	9	14	20	27	35	44	54	65	inches.

This table is not correct for every rifle, but it may be of assist-

ance. The bullet in its course is affected by the *wind*. The least puff is sufficient to throw the ball from the spot aimed at, therefore allowance must be made for wind, and constant care taken of its change in force or direction. It should be carefully noticed whether the conformation of the ground is such as will cause it to blow with greater force, or in a different direction, at different points between the shooter and target. A strong wind blowing toward the firing point from the target depresses the bullet, and, in accordance with its force, *more* elevation is required. A wind from rearward assists the bullet to rise, and consequently *less* elevation is required. The following tables are from Wingate's Manual :

CLASSIFICATION OF WINDS.

Gentle	4 miles an hour	1
Moderate	10 " " "	2
Fresh	20 " " "	3
Strong	35 " " "	4
Very high	50 " " "	5
Gale	80 " " "	6

ALLOWANCES FOR CROSS-WIND (IRRESPECTIVE OF DRIFT).

Right Wind.

Force.	1	2	3	4	5	6
Distance (yards).	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.
200	0. 3	0. 5	0. 7	0. 9	1. 1	1. 4
300	0. 5	0. 8	1. 0	1. 2	1. 9	2. 0
400	0. 7	1. 0	1. 6	2. 0	3. 0	4. 0
500	0. 10	1. 6	2. 6	3. 6	5. 0	7. 0
600	1. 4	2. 0	3. 6	5. 0	7. 0	10. 0
700	1. 8	3. 0	4. 9	7. 0	9. 0	13. 0
800	2. 0	4. 0	6. 6	9. 0	12. 0	17. 0
900	2. 8	5. 6	8. 6	12. 0	16. 0	23. 0
1000	3. 6	7. 0	11. 0	16. 0	21. 0	30. 0

Left Wind.

Force.	1	2	3	4	5	6
Distance (yards).	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.
200	0. 4	0. 6	0. 8	0. 11	1. 3	1. 6
300	0. 6	0. 9	1. 0	1. 4	2. 0	3. 0
400	0. 8	1. 2	2. 0	2. 6	3. 3	4. 6
500	1. 0	1. 8	2. 8	4. 0	5. 6	8. 0
600	1. 6	2. 3	4. 0	5. 6	8. 0	11. 0
700	1. 10	3. 6	5. 6	8. 0	10. 0	14. 6
800	2. 6	4. 6	7. 0	10. 0	13. 0	18. 6
900	3. 0	6. 0	9. 6	13. 0	17. 0	25. 0
1000	4. 0	7. 6	12. 0	17. 6	22. 0	34. 0

In estimating the force of the wind, divide it as classified above, watch its effect upon the smoke at the firing points and the flags at all points. The direction of the wind may be indicated by holding a watch with the figure XII at the target and the figure VI at the firing point, and recording the number of the figure from which the wind blows. It is well also to study the effect of the atmosphere and light. In a dry atmosphere a rifle fouls more than in a damp air; shots in the former will average less. The condition of the atmosphere must be considered also in adjusting the elevation. If the day is clear and bright the elevation should be *less* than when the sky is overcast. The refraction upon a bright, clear day causes the targets to appear to be elevated above their real position, and if the average elevation were used the shots would go high. On dark, cloudy days the targets seem further distant than they really are; consequently the elevation should be *greater*. The same is the rule later in the day; when the sun is setting the targets appear lower. The passing of clouds may obscure or light up the target, while the firing point is not affected. If the target is thrown in the shade, aim *higher*; if the sun lights up the targets, but not the sights, aim *lower*. If the sun shines full upon the sights it has the effect of lighting up the right side of the fore sight and left side of the back sight, and the result is that the ball will go to the left. (This applies to open sights only, not to covered long range sights.) If the barrel is not cleaned after each shot, increased elevation each time it is fired is necessary, or the bullet will go low. Many think it is best always to aim at the lower left hand side of the bull's eye, as when the sight is taken on the bull's eye direct the fore sight disappears or a blur exists; the former aim also has a tendency to overcome the drift of the rifles. Never load the rifle till the position is taken at the firing point, and then keep it at half-cock until ready to aim. Never fire till sure the aim is good. Be sure the sights are perpendicular. Keep cool. Never take advice unless satisfied that the party giving it knows more than you do yourself. Allow no one to handle your rifle. Study, practice, and keep a record of every shot; time will do the rest.

TEAMS.

All teams should be selected from the most tried and reliable shots. The captain of the team should be a practical rifleman. The order of shooting of the team should be always alike. The

earliest to shoot should be chosen for good judgment as to wind-allowance and elevation.. They should be followed by the steady and trustworthy shots. The difference in elevation and wind gauge of each man's rifle should be habitually noted by the captain, so that if one of a competing team makes a good shot the others can regulate their elevation, &c., accordingly. Change of wind should be communicated at once to those about to fire. A miniature target may be erected at the firing point, upon which each man should indicate where his shot struck, while at the same time he should note in columns prepared for the purpose his elevation and wind gauge. Thus every rifleman can see and take advantage of the previous shots without asking questions. Colonel Wingate, than whom there is no better authority, says: "Discipline and union in a team will always enable inferior marksmen to surpass those who are much better individual shots, but have a poorer organization." "Comply strictly and honorably with every rule of the match, and never object to another's conduct unless he is taking an unfair advantage. There is no nuisance upon a range like a chronic protestor. If you are a better shot you will beat him; if not, your complaints will come with bad grace. Do not experiment in a match, or use any rifle, ammunition, method of sighting, or position that you are not familiar with. And finally, if, after having done your best, you are fairly beaten, *own up*."

To which may be added, Congratulate the victor!

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On the following pages are given blanks which will be found exceedingly convenient for recording the results of practice, showing Range, Date, Class and Distance of Target, Kind and Caliber of Rifle, Kind and Weight of Powder, Weight of Bullet, Kind of Sight, Temperature, Elevation, Direction and Gauge of Wind, Number and Score of Shot, and, finally, *Total Score*.

The cuts of the different classes of Targets used show the bull's eye in a light shaded tint, which sufficiently indicates its position and character, while leaving the surface light enough to receive pencil marks. Every shot, as soon as made, is to be marked with its number (1, 2, &c.,) on the portion of the target which has been struck, and its score duly indicated opposite the corresponding number of the record below the target-cuts.

No single form, it is believed, has as yet been made which combines more of these necessary records in one ; and it is hoped that these forms may meet the approval of Riflemen in practical operation.

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Long Range Score Card.

RANGE.

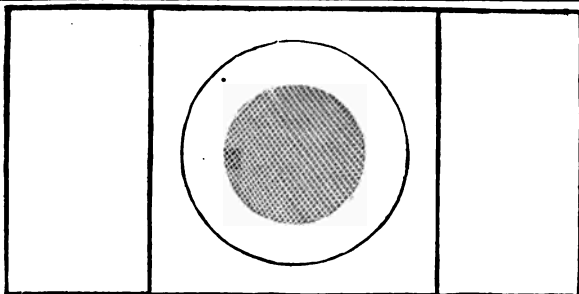
DATE.

RIFLE.

CALIBRE.

Target.

Yds.



No. of Shot.	Score.	Elevation.	Wind Gauge.	Direction Wind	grs.	Total Score,
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						

Long Range Score Card.

RANGE.

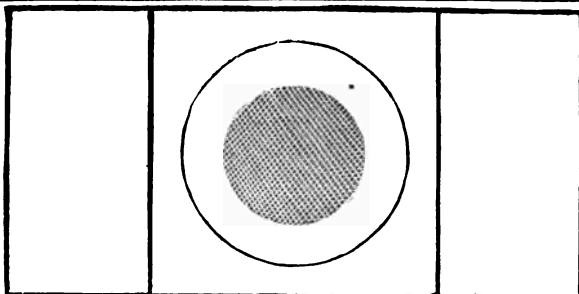
DATE.

RIFLE.

CALIBRE.

Target.

Yds.



No. of Shot.	Score.	Elevation.	Wind Gauge.	Direction Wind	grs.	Total Score,
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						

grs.

**Bullet weighs
Kind of sight,**

Total Score,

grs.

**Powder,
Weight,**

Temperature,

Long Range Score Card.

RANGE.

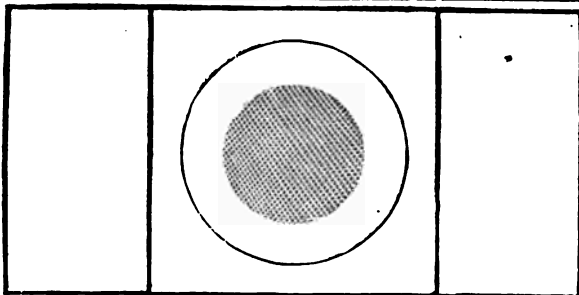
DATE.

RIFLE.

CALIBRE.

Target.

Yds.



No. of Shot.	Score.	Elevation.	Wind Gauge.	Direction Wind	Bullet weighs Kind of sight,	Total Score,
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						

Long Range Score Card.

RANGE.

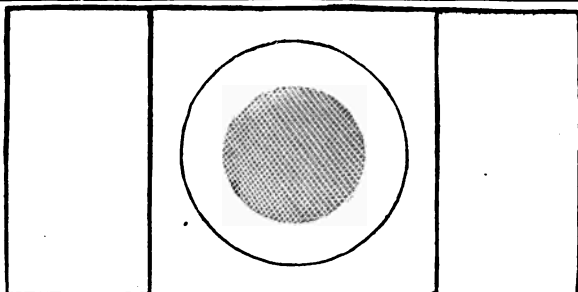
DATE.

RIFLE.

CALIBRE.

Target.

Yds.



No. of Shot.	Score.	Elevation.	Wind Gauge.	Direction Wind	grs.	Bullet weighs Kind of sight,	Total Score,
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							

Mid Range Score Card.

RANGE.

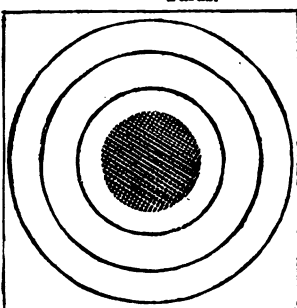
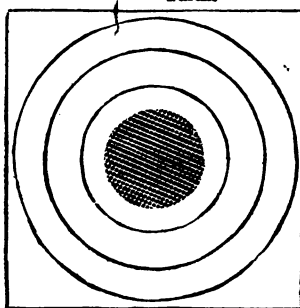
DATE.

RIFLE.

CALIBRE.

Yards.

Yards.



No. of Shot.	Score.	Elevation.	Wind Gauge.	Direction of Wind.	gr.	No. of Shot.	Score.	Elevation.	Wind Gauge.	Direction of Wind.
1					Bullet weighs	1				
2					Kind of sight,	2				
3						3				
4						4				
5						5				
6					gr.	6				
7						7				
8						8				
9						9				
10						10				
Total Score					Kind powder, Weight,	Total Score				
					Temperature,					

Mid Range Score Card.

RANGE.

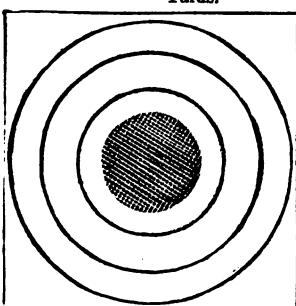
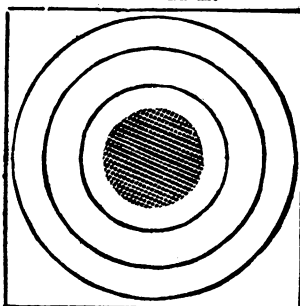
DATE.

RIFLE.

CALIBRE.

Yards.

Yards.



No. of Shot.	Score.	Elevation.	Wind Gauge.	Direction of Wind.	gra.	No. of Shot.	Score.	Elevation.	Wind Gauge.	Direction of Wind.
1					Bullet weighs Kind of sight,	1				
2						2				
3						3				
4						4				
5						5				
6					Kind powder, Weight,	6				
7						7				
8						8				
9						9				
10						10				
Total Score					Temperature,	Total Score				

Short Range Record.

DATE,		DATE,		DATE,	
Shot No.	Score.	Shot No.	Score.	Shot No.	Score.
1		1		1	
2		2		2	
3		3		3	
4		4		4	
5		5		5	
6		6		6	
7		7		7	
8		8		8	
9		9		9	
10		10		10	
Total,		Total,		Total,	

REMARKS.

Short Range Record.

DATE,		DATE,		DATE,	
Shot No.	Score.	Shot No.	Score.	Shot No.	Score.
1		1		1	
2		2		2	
3		3		3	
4		4		4	
5		5		5	
6		6		6	
7		7		7	
8		8		8	
9		9		9	
10		10		10	
Total,		Total,		Total,	

REMARKS.

Short Range Record.

DATE,		DATE,		DATE,	
Shot No.	Score.	Shot No.	Score.	Shot No.	Score.
1		1		1	
2		2		2	
3		3		3	
4		4		4	
5		5		5	
6		6		6	
7		7		7	
8		8		8	
9		9		9	
10		10		10	
Total,		Total,		Total,	

REMARKS.

Short Range Record.

DATE,		DATE,		DATE,	
Shot No.	Score.	Shot No.	Score.	Shot No.	Score.
1		1		1	
2		2		2	
3		3		3	
4		4		4	
5		5		5	
6		6		6	
7		7		7	
8		8		8	
9		9		9	
10		10		10	
Total,		Total,		Total,	

REMARKS.

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